Math 3C   Fall 2014
Pre-lecture 9-1 Due: Beginning of lecture-Monday, December 1.

This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and "pre-lecture [number]" (in this case "pre-lecture 9-1").

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

All units on this assignment will be in radians, not degrees. This assignment will require a calculator (or to find one online). Therefore, remember to make sure your calculator is working in radians.

1. Recall that for every angle θ, there is a corresponding point on the unit circle. For example, the angle 0 corresponds to the point $(1, 0)$ while the angle $\pi/4$ corresponds to the point $\left(\sqrt{2}/2, \sqrt{2}/2\right)$.

   (a) Find the equation of the line that goes through the origin (recall this is $(0, 0)$) and the point corresponding to the angle 0. What is the slope of this line?

   (b) Find the equation of the line that goes through the origin and the point corresponding to the angle $\pi/6$. What is the slope of this line? In addition to the exact value, find the decimial approximation (using a calculator) of the slope up to 4 places.

   (c) Find the equation of the line that goes through the origin and the point corresponding to the angle $\pi/4$. What is the slope of this line? In addition to the exact value, find the decimial approximation (using a calculator) of the slope up to 4 places.

   (d) Find the equation of the line that goes through the origin and the point corresponding to the angle $\pi/3$. What is the slope of this line? In addition to the exact value, find the decimial approximation (using a calculator) of the slope up to 4 places.

   (e) Find the equation of the line that goes through the origin and the point corresponding to the angle $\pi/2$. What is the "slope" of this line? Does this question make sense?

2. Find the `tan` button on your calculator or find something online that calculates the tangent of an angle.

   (a) Plug in $\tan(0)$.
   (b) Plug in $\tan(\pi/6)$.
   (c) Plug in $\tan(\pi/4)$.
   (d) Plug in $\tan(\pi/3)$.
   (e) Plug in $\tan(\pi/2)$. What happens here?

3. Compare all of these answers of Problem 2 with what you got for Problem 1. What do you notice? You may have seen the formula for $\tan(\theta)$. It is

$$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}.$$

Using this, can you describe the relation between the answers in Problem 1 and Problem 2?